

REMARKS

This Amendment is submitted in reply to the non-final Office Action mailed on January 3, 2006. No fee is due in connection with this Amendment. The Commissioner is authorized to charge any additional fees which may be required, or to credit any overpayment to Deposit Account No. 02-1818. If such a withdrawal is made, please indicate the Attorney Docket No. 112701-536 on the account statement.

Claims 5-11 and 19-20 are pending in this application. Claims 1-4 and 12-18 were previously withdrawn. In the Office Action, the specification and Claims 5-6 are objected to and Claims 5-11 and 19-20 are rejected under 35 U.S.C. §112, first paragraph. In response the specification and Claims 5-6 have been amended. This amendment does not add new matter. In view of the amendment and/or for the reasons set forth below, Applicants respectfully submit that the rejections should be withdrawn.

In the Office Action, the specification and Claims 5-6 are objected to. In response, the specification and Claims 5-6 have been amended to address the informalities cited by the Patent Office. Accordingly, Applicants respectfully request that the objections to the specification and Claims 5-6 be withdrawn.

In the Office Action, Claims 5-11 and 19-20 are rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the enablement requirement. Specifically, the Patent Office alleges that, in the absence of any further guidance, it would require undue experimentation on the part of one of skill in the art to determine if other peptides need to be added and if extra free amino acids need to be added to generate an appropriate ratio of ingredients to optimize cocoa flavor.

Applicants respectfully disagree with the Patent Office's assertions that the specification does not disclose any taste tests performed on cocoa powder made from transgenic cocoa beans that have been engineered to express the peptides and that no transgenic cocoa beans have been produced that express SEQ ID NO:1 or fragments comprising SEQ ID NO:3. For example, the specification teaches that the present invention provides, in part, for a recombinant nucleotide encoding the polypeptides of the invention, preferably a nucleotide sequence encoding at least one of the new polypeptides or fragments thereof. Such nucleotides may be easily derived from the given polypeptide sequence by translating the amino acid according to the genetic code into

corresponding triplets. Such a nucleotide sequence may well be expressed in a suitable cell by means well known in the art, for example, such as in bacterial cells, E. coli, yeast, insect cells, mammalian cells or plant cells.

To this end, a nucleotide sequence encoding a polypeptide of the present invention can be inserted into a suitable vehicle, such as an expression vector, and is incorporated into a cell of choice. With respect to plant cells, the nucleotides encoding the polypeptides of the present invention may also be incorporated into any of the plant cell's chromosome by using, for example, the phenomenon of homologous recombination. In this respect, at least one copy, preferably more than 40 copies of a nucleotide sequence, encoding any of the present polypeptides may be present on the DNA sequence to be inserted into a plant's cell's chromosome.

The present invention further encompasses the generation of plants comprising the recombinant cells. Preferably the transformed plant is a cocoa plant. Furthermore, the invention provides for the use of the polypeptides for the manufacture of cocoa flavor. To this end it is envisioned that the present polypeptides may be added to a fermentation mixture of cocoa beans, in order to provide a higher amount of the polypeptides for degradation. When using cocoa plants that have been modified by recombinant means and contain a high number of copies of nucleotide sequences encoding the polypeptides of the present invention, the plants will inherently contain a higher concentration of the polypeptides and eventually will result in the production of a stronger cocoa flavor after the processing. See, specification, page 4, line 29 to page 5, line 14.

Applicants respectfully submit that there is adequate disclosure of transgenic cocoa beans that express the polypeptides or fragments thereof in paragraph and that the claimed invention can be carried out by means well known in the art. Therefore, Applicants do not believe that further examples of taste tests are necessary.

Furthermore, the specification at page 5, lines 8-14, clearly teaches that cocoa plants that have been modified by recombinant means and contain a high number of copies of nucleotide sequences encoding the polypeptides of the present invention will inherently contain a higher concentration of the polypeptides and eventually will result in the production of a stronger cocoa flavor after the processing. Indeed, there are clear disclosures of the improved taste or flavor of

cocoa plants after processing (e.g. a cocoa powder will be obtained after processing) in accordance with the present invention as understood by those having ordinary skill in the art. Accordingly, Applicants do not believe that additional examples are necessary.

Regarding the Patent Office's statements that *Roedel* et al. teaches that cocoa flavor is produced by the fermentation of cocoa beans followed by heat treatment in the presence of reducing sugars and that the flavor requires the presence of peptides in addition to free amino acids, Applicants note that the specification also teaches reacting the peptide with a reducing sugar and enzymatic degradation of the peptides followed by reacting the fragments with reducing sugars. See, specification, page 3, lines 11-13 and lines 17-19. Therefore, the specification clearly teaches the hydrolysis of the polypeptide and then the reaction with sugars. Addition of amino acids can be done but is not essential.

Regarding the Patent Office's statements that *Roedel* et al. teaches that the source of protein to generate the peptides is important, Applicants submit that with respect to embodiments of the present invention, the source of the protein is not important. Instead, the sequence is important. In fact, the proteins may be derived from any source as long as the sequence is the same.

Regarding the Patent Office's statements that *Kochhar* teaches that little is known about the nature and type of peptides generated from cocoa seed proteins that are important in the generation of cocoa flavor, Applicants have identified novel polypeptides having a specific sequence that can produce cocoa flavor irrespective of the source.

Regarding the Patent Office's statements that there is no data which shows that increasing levels of peptide alone would generate improved flavor since, according to *Hansen*, reducing sugars and peptides are also required, Applicants submit that the specification clearly teaches that plants containing higher concentration of the polypeptides will have a stronger cocoa flavor after processing (see, specification, page 5, lines 8-14) and specifies reducing sugars and products of peptide degradation (amino acids). See, specification, page 3, lines 11-13 and lines 17-19. Applicants believe that optimization of the flavor by determining the appropriate amounts of reducing sugars and amino acids is well within the capacity of the person of ordinary skill in the art with simple trial and error experimentation.

Because the polypeptides are novel, Applicants believe that it is appropriate to claim them per se, as well as polynucleotides, vectors, transformed cells and plants, etc., comprising a

nucleotide sequence encoding the polypeptides as currently claimed. Further, nucleotide sequences may well be expressed in a suitable cell by means well known in the art. As a result, Applicants respectfully submit that the specification enables one of skill in the art to make and use the invention claimed without undue experimentation.

Based on at least these noted reasons, Applicants believe that Claims 5-11 and 19-20 fully comply with 35 U.S.C. §112, first paragraph. Accordingly, Applicants respectfully request that the rejection of Claims 5-11 and 19-20 under 35 U.S.C. §112 be withdrawn.

For the foregoing reasons, Applicants respectfully request reconsideration of the above-identified patent application and earnestly solicit an early allowance of same.

Respectfully submitted,

BELL, BOYD & LLOYD LLC

BY 

Robert M. Barrett
Reg. No. 30,142
Cust. No. 29157

Dated: March 27, 2006